THE INCREASED PRODUCTION OF GOLD.

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A QUESTION is gradually shaping itself in the minds of men who take a long look ahead which in an apparently simple form yet involves most complex problems. That question is : "What will be the effect of the great annual additions to the world's stock of gold which are now certain to be made for many years to come ?" This additional supply of gold is produced under very different conditions from those under which the last great supply was added when the gold product of California and Australia was developed. At that time the greater part of the gold was derived from placer mines by surface washing or from separate and distinct deposits or pockets corresponding to the Comstock lode. For many years this product was developed by chance and not by science : the profits were attained indiscriminately by common laborers—by men wholly ignorant of mining, or by men of science, aptitude and previous education. It was subject to no rule and there could be no estimate of the cost of production either in terms of labor, in terms of exchange for the goods and wares consumed in the processes, or by any comparison with general prices.

The present product of gold is being developed under totally different conditions. The sources of gold are the great "reefs" of South Africa, doubtless corresponding to the original sources of the gold which was found in the gravels of California and Australia; or in corresponding veins or "chimneys" in Cripple Creek and other corresponding places in this country or in Australia ; or in a huge area of clay gravels lying between the Andes and the sea in Ecuador in which the gold is held in suspension throughout the mass, and not merely in the "pay dirt at the bottom of a deep bed of loose gravel as in California.

While there are still many chances in prospecting for gold, yet the working of the principal deposits is no longer to any extent a matter of chance. It has become a branch of regular industry to which mechanical and chemical science has been most fully applied—in which labor and capital are worked together under intelligent direction—and of which the cost of production can in many instances be computed with a very close approach to accuracy. In other words, while one may look on in wonder and amazement at the feats in the "Kaffir Circus" and wonder which of the performers will win at the loss of all the rest, yet underlying all that excitement, men of the most profound ability are computing the cost of manufacturing gold ingots as deliberately as other men compute the cost of pig iron, steel bars or cotton fabrics, and in a considerable measure they are dealing with known and established factors in reaching their conclusions.

This work is being conducted in four different continents at the same time by men of the English-speaking race operating upon deposits of immense potential of which the product will be limited only by the cost of production and by the world's demand, but of which the supply must be in excess of any previous quantity ever brought to the knowledge of mankind. These deposits being in South Africa, in Australia, in Ecuador and in the Western States and Territories of North America from Alaska to California inclusive, substantially all this work is being done under the safe conditions of English law; the treaties with Ecuador assuring fairly safe conditions in the conduct of the work in a state which constitutes the single exception in not being under the governmental control of the English-speaking people.

Before we can comprehend these changed conditions and their prospective influence, the monetary events of a century must be condensed into a single page. Under the relatively unsafe and unscientific conditions of the period from 1801 to 1850 inclusive, before the discoveries of gold in California and Australia had begun to affect supplies, the product of gold of the world had been a little under eight hundred million dollars ($800,000,000), which was added to the world's stock at the average rate of sixteen million dollars ($16,000,000) a year. Then came the wild excitement, the great supply from the gold washings from the Comstock lode and other events. In twenty years, from 1851 to 1870 inclusive, the addition to the world's

stock of gold amounted to a fraction under twenty-six hundred million dollars ($2,600,000,000), at the average rate of one hundred and thirty million dollars ($130,000,000) a year. Soon after 1870 came the disturbance in the monetary systems which led to the legal tender legislation of 1872 and 1873 in Germany and the United States, followed by the action of the Latin Union and of India, the end of which changes was to establish gold as the unit of value among the great commercial nations. After 1870 there was a moderate falling off in the production of gold, and the change in the methods of its production began. From 1871 to 1890 inclusive the amount added to the world's stock of gold was a little over twenty-two hundred million dollars ($2,200,000,000) at the average rate of one hundred and ten million dollars ($110,000,000) a year. In 1891 the influence of these changed conditions and the application of science to mines, reefs and deposits under a system of regular industry led to an immense and constant increase of the supply. If the estimate for the year 1895 is attained, there will have been added to the world's stock of gold in five years, 1891 to 1895 inclusive, over eight hundred and twelve million dollars ($812,000,000), at the average rate of one hundred and sixty-two million dollars ($162,000,000) a year, the present year probably yielding two hundred million dollars ($200,000,000), the average production of gold only in this five years amounting to more than the average product of gold with silver added at its former coinage valuation in the period from 1851 to 1870, when California and Australia were yielding their greatest supplies of gold.

Having thus compared the conditions of what may be called the manufacture of gold and silver ingots in the period from 1850 to 1890 with those governing the same branch of manufacture in 1891 to 1895 inclusive, we may now approach the problem presented by the title of this paper: What will be the influence of this great increase in the production of ingots of gold under the present conditions of order, safety, and the application of science to mines of regular industry, these conditions corresponding closely to those which govern the production of iron, copper, and other metals?

In dealing with this problem the writer will assume that the world's commercial unit of value is now fully and finally established. It is a fixed weight of gold incorporated in ingots or in

coins manufactured from ingots of gold; silver ingots and silver coin having been displaced by the final recognition of the fact that there can be but one monetary unit or standard of value at one time, to which or by which unit all other products including silver will be rated; that is to say, all prices will be finally established at a given ratio in each of four seasons making one year, by their estimation or rating to this single gold standard.

This leads directly to the consideration of prices and wages. In order to get some clue to the influence of sudden and great increase in the manufacture of ingots of gold at a lessened cost at the present time one may rightly attempt to measure the influence of the same great and sudden increase in the production of gold from 1850 to 1870. But in order even to begin to comprehend the elements of this problem one must give a hasty glance over the industrial history of the nineteenth century, in which the great applications of science and invention have displaced the handicrafts of the earlier period in all the arts—in which period the great commerce of the world in the necessaries of life has been developed—in which period the obstruction of distance has been sunk in a fraction of a cent a ton per mile in moving the necessaries of life from the uttermost parts of the world—and in which period also national debts, standing armies and national navies have reached a magnitude as impossible of being sustained without disaster as they are impossible of being removed without revolution. At the beginning of the century every nation, state, county district, and even every town and hamlet, was almost self-sustaining, each family producing for itself and storing in each year the larger part of its own product of food, fuel, fibres and fabrics of every kind. Between 1840 and 1850, immediately before the great additions to gold were made from California and Australia, the railway had begun to affect all commerce upon land and the steamship had begun to alter the conditions of international commerce, these two new factors leading rapidly to conditions which taken in connection with the increased application of mechanism to production might have been expected to cause a rapid reduction in the prices of all the necessaries of life corresponding to the reduction in the labor cost thereof. Such a general reduction in prices might perhaps have been anticipated except the medium of exchange and the credit system had alike become more adequate to meet the needs. The new supplies of gold served as the

basis of that extension of credit and of that commerce. In place of a reduction in prices at the gold standard, after a period of considerable variation there was a gradual, and finally a rapid rise in prices, culminating in 1873. Hence the changes which under uniform or diminishing conditions of a supply of monetary metal might have brought about a reduction in prices was met by the increase in the volume of gold and by many other elements of change, notably by a greatly increased consumption of goods, with the effect named. The subsequent fall in prices since 1873 can be accounted for in respect to every leading article of commerce by further and more startling reductions either in the cost of production or in the cost of distribution without having any recourse to the moderate changes which have occurred in the relative supply of gold since that date down to the recent great additions. Space cannot be given in this article to any minute statement of these facts.

Such a discussion of prices would call for a consideration of the Austro-Prussian War, the Franco-Prussian War, and the War of the Rebellion in this country, with all the influences which these events exerted upon prices and upon monetary systems, especially the suspension of specie payments in most of the countries which were engaged in these wars. During that period Great Britain became the place of safe deposit of the civilized world, capital trending toward England from every quarter in order to be put under the security of the unimpaired gold unit of value of Great Britain. It may be held that when the people of this country become aware of their true interest, doing away with every doubt about the stability of the gold unit of value, the United States may become the safe deposit of nations whenever the great war ensues, which seems so near and yet so far away. But even if the passive war which is eating out the heart of Europe by heavy taxation and destructive expenditure should not culminate in active war, yet the capital and the best blood of Europe among the laboring people will inevitably trend toward this country in order to attain security for life and property, exemption from conscription and the opportunity to work under the conditions of safety which yield the high wages and good subsistence that are the complement or correlative of the low cost of production which prevails in this country.

After a few years of rapid reductions in prices a level has been

reached subject only to the moderate changes due to varying seasons. The average prices for the last few years of the necessaries and comforts of life, of the metals and of most fabrics, has not varied materially from the averages of the years 1845 to 1850, just preceding the additions to gold. May it not be held under these conditions that the quantitative theory exercises its influence very slowly, but that in the very fact that the general level of prices of late years has not varied materially—being but very little less than those immediately preceding the enormous additions of gold—we have evidence that both gold and silver have lost a part of their purchasing power, silver having been depreciated by the greater abundance of gold and its substitution in bank reserves and as a unit or standard of value by the great commercial nations ?

At the present time all civilized nations have become interdependent—the world has become one great neighborhood—all men live by an exchange of products or of services, and in spite of wars of tariffs and wars of monetary systems, which have in great measure survived the wars of race and creeds, men serve each other more and more in all the transactions in which money is made use of, or of which the terms of the exchange are stated and measured in terms of money. In order to reach even a glimmering comprehension of the influence of our annual increase of the metal of which true money is now made—true or good money meaning only that kind of coin which is worth as much after it is melted as it purports to be worth in the coin—we may make an approximate estimate of the annual transactions or exchanges, both domestic and foreign, of the four groups of machine-using nations whose product has been increased and whose cost of production has been diminished by science and invention. In this attempt to give a faint idea of the magnitude of the exchanges in which trade and commerce consists, I must use figures which are in my own judgment fairly well established, especially in respect to this country and by analogy in other countries. The product of the United States is ratably to population the largest, the cost of production the lowest, and consequently the wages or earnings of the people the largest when measured by quantity, or highest in money, as compared to all others. I compute the total product of this country at the present time at two hundred and twenty-five dollars' ($225) worth of food, fuel, fibres and fabrics per head.

I then estimate other countries by analogy on this basis; this analogy being mainly established by the difference in the rates of wages or earnings, which being recovered from the sale of the product may be taken as a fair standard by which to estimate the relative product of the several states or nations.

United States: Population approximately 70,000,000—producing within its own area an excess of food, fuel, timber, ores and fibres—annual product computed at $225 per head...	$15,750,000,000
Great Britain and Ireland: Population approximately 40,000,000—deficient within its own area in food, ores and fibres—annual product computed at $170 per head...........	6,800,000,000
	$22,550,000,000
Germany, Belgium and the Netherlands: Population approximately 64,000.000—food barely adequate, often deficient; also deficient in fuel, timber and fibres—annual product computed at $125 per head..	$8,000,000,000
France: Population approximately 40,000,000. Deficient in fuel, ores and fibres; rich in agriculture—annual product computed at $150 per head..	6,000,000,000
Total population in round figures, 214,000,000.............	$36,550,000,000
These are approximate estimates only, which may serve to give a slight comprehension of the problem.	
Let it be assumed that one-fourth part of this product is consumed where it is produced, without purchase or sale, and therefore without the use of money; say.................	$9,550,000,000
Remainder..	$27,000,000,000

The exports of domestic products of these countries amount in value to over $4,000,000,000, a sum which comes to a little under fifteen per cent. of the above valuation. As our own domestic exports are less than six per cent. of the valuation which I have put upon our product, this established sum of the exports of all named goes far to prove that the value of the subjects of all commerce, domestic and foreign, must be estimated at as much as $27,000,000,000 and probably more.

This remainder is an approximate measure in terms of money of the value of the subjects of trade and commerce of the countries named in this list only. But before these articles of food, fuel, fibres and fabrics reach the consumer they have been converted and reconverted from the crude to the finished condition and in each of these transformations there has been a purchase and a sale in terms of money. Each reader may follow in his own mind the transformation of the ores into mechanism and tools—of the timber into buildings, furniture, etc.—of the grain into bread, dairy products and meats—and of the fibres into clothing. I think at least three purchases and sales will be admitted as a moderate estimate. It follows that the transactions

of these four groups in the distribution of $27,000,000,000 worth of products come to the incomprehensible sum of $71,000,000,000 a year at the present time. It is useless to attempt to reason on such a basis of figures since they convey little or no meaning to the mind of any one except for purposes of comparison, but by again reducing them to individual terms we may gain a clear view. If that sum be the measure of the trade of 214,000,000 people, the average is a fraction under three hundred and thirty-two dollars ($332) a year to each person in these transactions or purchases and sales.

In the United States the annual transactions measured in terms of money in goods and wares only unquestionably exceed $500 a year to each person, making the minimum volume of trade ($35,000,000,000) thirty-five billion dollars.

.Again, the readers of this article may gain a clearer view of the nature of this problem by passing in review the number of purchases and sales which have been necessary in order to put three to five pounds of food on their tables each day for each member of their households, forty to fifty yards of textile fabrics per year on their backs, and a shelter over their heads. If they will again deal with distance as an element of commerce they will find that the sources of their food, clothing and shelter averaged over a thousand miles from their present dwelling places. Again, it will be observed that this is the measure of the commerce of only one-seventh of the population of the globe in goods and wares necessary to life without regard to land, stock and bonds.

We now begin to find a standard by which to compare the amount of gold now estimated to be in monetary use, customarily computed at about $4,000,000,000—and the annual addition which may reach in 1896, $214,000,000. On these estimates the existing quantity of gold in use would come to less than twenty dollars ($20) per head of these specific countries only, containing only one-seventh of the population of the globe, and the annual addition would be only one dollar ($1) per head in ratio to this seventh of the population.

It will be remarked that this annual product even if it reaches $214,000,000, will bear the ratio of only fifteen cents per head of the whole population of the globe now computed at over 1,400,000,000. Of this sum it is commonly held that one-half or more is used in the arts, yet it suffices as a monetary standard or

unit of value, there being a greater mass of gold held in the reserves of banks than was ever known before.

It is by such computations that one may prevent himself from being dazed or misled by estimates of the production of gold computed in tens and hundreds of millions.

It will also be observed that even if a large margin must be allowed for errors in the computation of national product and of the volume of trade, yet diminish them or increase them as we may, the fact remains that, whatever may be the present or prospective product of gold in the near future, it bears but a mere fractional ratio to the large volume of trade of which it has become through a long process of natural selection the sole standard or unit of valuation, and such it will continue to be in spite of legal tender acts, treaties of legal tender called bimetallic, or any other device by which any attempt is made to compel men to use anything but the safest, surest, and most uniform unit or standard of value yet evolved in the experience of mankind.

This process of reasoning and these facts bring us to the inevitable conclusion that the work of the modern world is and must be conducted mainly by the use of instruments of credit and not by the use of coin of any kind.

On the other hand the necessary conclusion is that an adequate credit can only be established upon the sole unit of value which has become the world's monetary standard. That unit is gold passing by the measure of weight in the form of bars, ingots or coin.

In the face of the paramount necessity of the commerce of the machine-using nations which dominate the commerce of the globe, the attempt has failed to set up two standards or units, one of gold and one of silver—the increasing abundance of gold enabling this displacement of silver to be carried into effect without any serious temporary difficulty and without any adverse influence of a permanent character.

In 1850—that is to say in the middle of this century of the development of the great commerce of the world in the necessaries of life—the modern instrumentalities of the railway and the steamship had just begun to reduce the cost of these exchanges and to make an enormous increase of commerce possible. That increase of commerce required a corresponding increase in credit and again that increase of credit required a

corresponding increase in the monetary metal which was then rapidly becoming the world's unit of value—namely gold. That demand was met by the supply from California and Australia.

We are now approaching the beginning of another century in which the forces which make for the development of commerce, for the increase of abundance and for the establishment of material welfare among men, are competent to give results of which the progress of the present century may be but a shadow. We are at the beginning only of the development of continents heretofore almost unknown and but little occupied. Witness the Trans-Siberian Railway with all that it portends—witness the opening of Africa and its passage from a *terra incognita* to one even now more fully developed than the prairies of our own country were little more than half a century since. Australia and New Zealand are now counted among the most progressive countries occupied by the English-speaking people and a beginning has been made in opening the ways of commerce in South America, now the single almost unknown land in its far but fertile and prolific pampas of the Argentine and Bolivia. In this development of continents the very search for gold is again one of the most potent influences making the way for the commerce which ensues, while at the same time supplying the basis of the credit which must be so rapidly extended in order to make the conduct possible of that increased commerce.

Upon this view of the necessities of trade, of the extension of credit, and of the movement of a huge and immeasurable increase in the exchanges of the world, the present and the prospective increase in the production of gold, while giving assurance of a supply adequate as a reserve for the vast extension of credit, yet presents no element of such an increase as to seriously affect its immediate value or estimation—that is to say, it will have no immediate or direct or quantitative influence upon prices and wages.

The present annual increase in the production of gold, although absolutely greater than even that of 1849 to 1870, is yet less in ratio to the vastly increased commerce of the world, for which it serves as a standard, and in the conduct of which it serves as the basis of credit or unit of redemption. It must now be observed, however, that there is not as great a margin for any further reduction in the cost of producing and distributing the necessaries of life among the great commercial nations at the

present time as there was in the former period. The reduction in the cost of all commodities necessary to life has been more rapid than the reduction in the cost of producing gold. Hence, if the cost of producing gold under existing conditions should be greatly reduced, and the product should increase rapidly even on the present large amount of the output, then the quantitative theory may again influence prices in a long period. The purchasing power of gold or its ratio to all other commodities may, in that event, show itself by a depreciation which would manifest itself in a very gradual but general rise of prices on the gold standard, which may not be explained by changes in the cost of the production and distribution of the commodities themselves. Any such immediate effect, however, may not be at present anticipated, since the vastly increasing commerce of the world will probably absorb all the gold that can be produced for many years without any serious quantitative influence. On the other hand the assurance of a constant and regular supply of gold will give to this and all other countries in which the gold standard is subject to no doubt, a basis for credit and for the expansion of commerce, for the increase of abundance and yet more for the increase of consumption which is the end of all trade and commerce, which may exert a powerful influence on prices, especially on the prices of those great commodities which have in this country so recently been depressed even below the cost of production by the doubt as to the stability of our unit of value. This doubt was brought upon us by the incapacity of Congress and its submission to the demands of the misrepresentatives of the nation, who forced legislation in the interest of the mining camps of the silver-producing states.

On the other hand the increasing commerce of these great continents now in process of development will create a rapidly increasing use of silver as a subsidiary coin; which increasing demand meeting a somewhat diminished production may tend to raise the ratio of silver to gold which will find its expression in an advancing price of silver. Hence the conclusion that the present quantitative increase in the product of gold will meet an increasing demand and will have no direct influence upon the prices either of property or of products.

If these propositions are sustained by the facts in the case, their lesson to the people of this country is plain and simple.

Among the machine-using nations of the world we hold the dominant control of iron, steel and copper. We, therefore, hold the paramount position in the production and in the application of the mechanism by which abundance is secured at the lowest cost, therefore yielding the highest rate of wages or remuneration to labor. We also hold the control of such share of the gold of the world as we may require as a basis for our credit, even if our own abundant product does not suffice. We may give our sympathy to the debt-burdened nations of Europe with which we compete while pitying them in their futile effort to sustain their huge standing armies and monstrous war fleets, the mere support of which reduces so large a portion of their people to the conditions of pauper laborers. We may wonder at the folly of those who would deprive us of our own position of advantage by their effort to destroy our credit in the interest of a few silver miners whose insignificant product has cost more than it has come to. Finally we may stamp with scorn and contempt upon the Jingoism of the hour which would put upon us the very burdens from which our competitors are trying to escape, but from which no escape except by violent revolution and long continued anarchy and disaster yet appears.

We may especially despise that type of Jingoism whose representatives try to break the peaceful relations of the English-speaking people, who are becoming more and more united in the pursuits of peace and order, and whose moral influence when once exerted in putting a final stop to the plunder of private property upon the sea even in time of war, may by-and-by give to our naval vessels the noble title of protectors of commerce in place of the degrading name of commerce destroyers by which some of our ships are now disgraced.

We may well deepen our harbors and widen their channels—we may well remove the natural and the legal obstructions to commerce so that our defence shall consist in the increasing service which we may render when "the ships that pass between this land and that shall be like the shuttle of the loom weaving the web of concord among the nations."

The foregoing text had been prepared in November. The publication has of necessity been delayed until the present number. In the interval an event of most profound significance has oc-

curred—a threat of war among the English-speaking people. This threat has brought into conspicuous notice the inseparable character of the moral and political forces with the material interests of the people of this country and of Great Britain. It needed only the threat of war to cause the thinking people and the masses of the workmen alike of both countries to forbid such a crime against humanity. Out of that danger great progress may ensue.

In order to attract attention to the material interests imperilled and also to the nature of our commerce with the gold standard states of the world, the following statement of the commerce of the ten years from 1885 to 1894 is submitted :

	Exports. Per cent.	Amount. Exports.	Amount. Imports.	Imports. Per cent.
Great Britain and her Colonies	60.	$4,765,830,100	$2,468,475,746	33.60
Holland, Belgium, France and Germany....................	22.79	1,809,533,962	1,705,605,336	23.22
	82.78	$6,575,364,062	$4,174,081,082	56.82
All other countries..............	17.21	1,367,982,873	3,172,315,519	43.18
	100.	....	$7,346,396,601	100.
Merchandise balance...........	......	....	596,950,334	......
	......	$7,943,346,935	$7,943,346,935	......

These figures are very significant. Sixty per cent. of our exports, consisting in by far the largest measure of farm products, are bought of us upon a gold basis by Great Britain and her Colonies. Twenty-three per cent. of our exports, also consisting in largest measure of farm products, are bought by the several machine-using nations of Europe—France, Germany, Holland and Belgium. Only seventeen per cent. of our exports, consisting in larger measure of manufactured goods, are bought by all other countries; but that branch of our traffic is very rapidly increasing since the virtual control of the iron and steel manufacture has passed to this country, while the removal of duties on wool and other materials entering into the processes of our domestic manufactures have put us more nearly on an equality in the cost of materials with other nations.

Bearing in mind that this country will probably take the first rank in the production of gold this year and that in each year for the last ten years two hundred and fifty million dollars ($250,000,000) has been placed at our credit in pounds sterling in the banking centres of the world in settlement for the excess of our exports above our imports in our traffic with the machine-

using nations, the fact becomes evident that this country holds a command over all the gold resources of the world. Nothing but our own incapacity as exhibited in Congress or the ill-advised action of the Executive in undoing the great service already rendered in the cause of sound finance by an ill-advised threat of war, can prevent the monetary system and the finances of this country being placed upon the most solid basis within a very short time. The logic of events is rapidly bringing every man who places sound legislation above party success to the necessity of making slow but sure payments of the demand debt of the country without making a new forced loan by reissuing any legal tender note that has been paid in coin. The masses of the country are becoming aroused to the fact that the worst attack that can be made upon their material interests is the forced circulation of bad money: good money, according to the admirable definition given by Cernuschi, the ablest leading advocate of bimetallism, being only that coin which stands the test of fire and which is worth as much after it has been melted as it purported to be worth in the coin.

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NOTE.—For an extended treatment of the economic elements of our commerce and their bearing upon this question see *Engineering Magazine* for February, 1896.